AMENDMENTS TO THE CLAIMS

1. (Currently amended) A laser detecting and ranging apparatus, comprising

a light transmitting unit for transmitting a light signal from a light source as a transmitted beam into the atmosphere,

a light receiving unit for receiving a light beam from the atmosphere as a received light,

an oscillator for outputting a modulating signal having at least one modulating frequency as a carrier frequency, and

a signal processing unit for detecting properties of said atmosphere on the basis of said received light,

~~characterized in that~~ wherein said light transmitting unit includes a light intensity modulator for performing intensity modulation on the light signal from said light source with said modulating signal, and that

said signal receiving means includes

optical frequency conversion means for converting the frequency of the intensity-modulated component of said received light to a base-band frequency, and

optical detection means for directly detecting an output signal from said optical frequency conversion means to thereby convert into an electric signal to be subsequently inputted to said signal processing unit.

2. (Currently amended) A laser detecting and ranging apparatus set forth in claim 1, ~~characterized in that~~ wherein said optical frequency conversion means is constituted by an optical mixer, and

that said optical mixer is designed to modulate intensity of said received light with a modulating frequency which approximately equal to a carrier frequency of said modulating signal.

3. (Currently amended) A laser detecting and ranging apparatus set forth in claim 2, ~~characterized in that~~ wherein said optical mixer includes a light intensity modulator for modulating at least one of phase, polarization and amplitude of said received light with a modulating frequency which is approximately equal to a carrier frequency of said modulating signal.